under the common order of zymotic diseases: is it wonderful that in some things they agree? The thistle and the sunflower both belong to the same natural order in botany, but are they identical? Dr. Creighton entirely suppresses every point in which the dissimilarity of the two diseases appears; but he insists upon nearly all those in which the similarity shows itself. In fact, his whole work is a piece of special pleading which anybody but a lawyer ought to be ashamed of.

It is easy enough to find some sort of resemblance between two inoculable diseases, and arguments of the kind found in Dr. Creighton's book might be multiplied greatly. We present him with another which we should have thought too good for him to have missed, but we will not promise him it will satisfy his readers more than those which he has himself adduced.

When the virus of the great-pox is taken early in the disease it will communicate its own specific characters, and will for a certain time render the individual to whom it is communicated immune from further contamination by the disease; but if the virus is taken in its later stages it will produce in the individual who is inoculated a sore which has often a tendency to ulcerate, to phagedena, &c., and this sore does not convey the constitutional symptoms of syphilis, nor does it render the individual immune from further manifestations of its own peculiarities. This similarity of the two poxes might, in Dr. Creighton's fashion, be shown in the behaviour of vaccinia, for if vaccine lymph is taken early it produces a constitutional disease of short duration which protects the individual from further vaccination for a time at least, and also from small-pox; but if the vaccine is taken late it produces a sore that has a tendency to ulcerate, to phagedena, &c., and which does not convey immunity to the individual against further vaccination or against small-pox. While referring to this point we may observe that all the bad results collected by Dr. Creighton following vaccination were from lymph taken at a too late stage, and the evils produced must be attributable to the ignorance of the vaccinator rather than the innate virulence of the lymph, or more fancifully still to any reversion to type.

Some of the points of dissimilarity he does not mention are these:—

Firstly, vaccination protects from small-pox when its virus is taken at the proper time, but it does not protect us against the great-pox.

Secondly, the microscopical appearances of a true chancre of early date are quite distinct from those of a vaccine vesicle.

Thirdly, the incubatory periods of the two diseases are utterly different.

It is easy to find points of similarity if we only look at the points of likeness. Thus with no great difficulty we might compare a man and a monkey, and it would not be difficult to argue that at a remote period of time they may have had a common ancestor; but now no one in his senses, except perhaps Dr. Creighton himself, would say that they are identical species.

Dr. McVail's book is altogether different. It is one of the most thoughtful works of the kind we have seen. We would commend it to everyone who is anxious to learn the truth about vaccination, especially to Members of Parliament and others who have a voice in the government of this great country, also to all medical men who neither have the time or inclination to dig deep into anti-vaccination literature. They will find complete answers to all the assumed evils of vaccination, as well as the evidences of the value of vaccination as a prophylactic against small-pox. There is also set forth what a fearful disease small-pox used to be, and how it has been robbed of its sting by vaccination.

Dr. Wallace's writing on this subject, whom we are ashamed as scientific men to find in the anti-vaccination ranks, are especially shown up and gibbeted. We may quote two passages in support of this assertion; they occur on pp. 70 and 87. Speaking of the possible errors in registration, Dr. Wallace instances three cases; of one of these Dr. McVail writes:—

> "It is pitiful to think of Dr. Wallace as being driven to appeal for one of his three instances of incorrect registration to such ravings as those of Mr. Pickering. But the abuse of vaccination is so largely buttressed by the relation of 'cases,' that the examination of these samples specially selected by so able an author seems not without use as illustrating the character of the whole class."

And on p. 87 Dr. McVail says after careful reading: "I have been further forced to the conclusion that, in this matter, when Dr. Wallace says 'the point in question has been entirely overlooked,' *the statement is a misstatement*, and that when he says 'it is nevertheless a fact,' then *it is not a fact*." The book is throughout so carefully and faithfully written, and deals so well with the tactics of the anti-vaccinators, that it ought to have a wide circulation among those interested in the question. Many are interested in seeing conjuring tricks, and in witnessing optical delusions. So long as the tricks are not understood, there is an inclination in the minds of some to regard these tricks as more difficult of performance than they really are, and some may even attribute them to supernatural agency. The same kind of tricks are played by such men as Dr. Wallace on our literary pursuits. Dr. McVail's book may be taken as exposing the tricks, and showing the mechanism by which they are done.

ROBT. CORY.

OUR BOOK SHELF.

Animal Biology. An Elementary Text-book. By C. Lloyd Morgan. With Illustrations. (London: Rivingtons, 1887.)

THIS volume has been written to meet the requirements of those reading for the London Intermediate and Preliminary Scientific Examinations, as well as for the Oxford and Cambridge Local. In it special attention has been paid to embryology, and there can be little doubt that the information in this volume would enable the attentive student, with some preliminary assistance, to make very considerable progress in the study of both anatomy and physiology.

The author treats of the anatomy and physiology of the vertebrates as exemplified by the frog, the pigeon or fowl, and the rabbit, with occasional references to other types; and of the invertebrate types, the crayfish, cockroach, earthworm, snail, fresh-water mussel, liver-fluke, tapeworm, hydra, vorticella, and amœba, are selected.

The illustrations have been engraved after original outline sketches of the author's, chiefly from dissections or preparations made in the biological laboratory of University College, Bristol. They are all the better for

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not being too pictorial; for a student, especially when left to his own resources, is often apt to be misled by over elaborated drawings.

In addition to the anatomical and physiological details given of each of the type forms selected, there is appended to each an excellent general summary of the life-history of the form; so that within the compass of a little over 350 pages we have a really valuable text-book of animal biology, which we would wish to place in the hands of all students. In Ireland, unfortunately, the Commissioners of Intermediate Education have omitted the subject of biology from the schedule for boys, and limited that for girls to the vegetable kingdom.

Practical Guide to Photographic and Photo-Mechanical Printing Processes. By W. K. Burton. (London: Marion and Co., 1887.)

IT is refreshing to find that the text of the second photographic work issued by these publishers is not made subservient to the advertisement of photographic specialties. The work before us is written by a gentleman well known for his practical rather than his theoretical acquaintance with photography. We thus have an account of the practical working of various processes, with a small modicum of theory. The chapters on silver printing and carbon printing are very clear and complete, and if followed out will lead the amateur to successful results. When we come to the photo-mechanical processes, however, there is at first sight presumable evidence of a lack of intimate knowledge of the subject. It may be, however, that there is a greater difficulty in describing these operations than in the ordinary printing processes to which we have alluded. We doubt very much if the descriptions given would enable a tyro to progress at a rapid rate. For the enthusiastic photographer who has time to experiment the directions would suffice to enable him to commence in the right way, and though at first he would inevitably blunder, yet he would after a sufficient number of disasters produce results which he might take a certain amount of pride in showing to his immediate friends, who would be likely to appraise them higher than at their market price.

In another edition we should recommend that the author should either expand the descriptions of his photo-mechanical processes, or omit them altogether. The work itself is nicely got up, the print is good, and the illustrations well executed.

A Treatise on the Diseases of the Dog. By John Henry Steel, M.R.C.V.S. (London: Longmans, Green, and Co., 1888.)

THOUGH the author of this manual does not claim to offer an original book on canine pathology, and though he assumes the modest *rôle* of compilator of canine literature—English and foreign—we venture to say that he is fully entitled to the claim of having produced an extremely useful work; useful in the first place to the veterinary profession, but not less useful to all those who, like sportsmen, dog-breeders, and dog-keepers, wish to possess a ready and authoritative book for study and reference.

All disorders to which the dog is subject are considered minutely, and in addition there are a great many useful data as to the anatomy and physiology of the canine organism well blended together.

The treatment of canine ailments, and the various methods of medical and surgical practice, form an integral part, and while the author's extensive practice enables him to speak with authority, he does not omit to mention the practice of others which he considers most commendable.

The numerous illustrations, copied from standard books, though not of the first order as regards execution and reproduction, nevertheless considerably enhance the text; this is particularly the case with those which illustrate the general appearance of the animal under the various severe internal disorders, as also those on medical and surgical practice.

But it must be regretted that in the illustrations on microscopic objects, of which there are a good many in this book, no statement is made in connection with the figures as to the amount of amplification under which the objects are supposed to be viewed. This is perplexing in itself, but becomes more so when we remember that there are other illustrations of anatomical parts which are represented smaller than natural size. But these minor details, which are easily corrected, cannot detract from the general usefulness of the work. E. KLEIN.

Management of Accumulators. By Sir D. Salomons. Third Edition. (London: Whittaker, 1888.)

THE author has considerably enlarged this edition of his work, and made it in some respects more complete.

The first part deals with accumulators, and principally with those of E.P.S., or Elwell-Parker type. The construction and principle of working of the cells is described, and hints are given as to the best method of setting them up and charging them. The ordinary causes of failure and the methods of guarding against them are discussed.

In the second part the arrangements of an installation for house-lighting are fully described, and hints, founded on the author's experience in lighting his own country-house for some years past, are given as to the management of engines, boilers, dynamos, lamps, switches, &c., as well as descriptions of the methods which he has adopted for so regulating the whole system by automatic appliances, that, as he says, "it is only needful to start and stop the engine, so that a man having no knowledge of electricity may be employed." He gives estimates for the capital expenditure and working expenses of installations of from 25 to 120 sixteen-candle power lamps. From these we learn that one of the latter size can be erected for £6 per lamp without accumulators, which latter add £3 per lamp to the cost, and the automatic regulating appliances bring up the cost to £10 per lamp. For fifty lamps the cost per lamp is about 50 per cent. greater, and for twenty-five lamps about twice as great. The annual cost, including interest and sinking fund, without accumulators, ranges from £2 16*s*. per lamp for 120 lamps to £4 4*s*. per lamp for twenty-five lamps, these figures being increased to £3 9*s*. and £6 respectively when accumulators and automatic regulators are used.

As was the case in the previous edition, there is much useful information in this book, but it is very badly written, so badly that the descriptions and explanations are often unintelligible. As an example we may quote from the chapter on the "Action of Cells with Dynamo" (p. 111). In discussing the relation between E.M.F. and current in machines of different types, he says, "Let us confine ourselves to the shunt dynamo, this has a falling curve, *i.e.* the E.M.F. falls as the current in the circuit is increased, due to two reasons, one is *the armature absorbs more power as the current is increased*" (the italics are ours); "and secondly the lowering of the outside resistance, to obtain an increased current, is in shunt with a fixed high resistance, viz. the shunt winding on the field-magnets, so that when the outside resistance is lowered to zero by short-circuiting the terminals, practically no E.M.F. exists, and no current passes."

Elementary Physiography. By J. Thornton, M.A. (London: Longmans, Green, and Co., 1888.)

THIS is an admirable introduction to the study of Nature by one whose experience in teaching must of necessity have indicated to him the requirements of beginners. The subjects are arranged according to the syllabus of the elementary stage of physiography, which will greatly extend the sphere of usefulness of the book. The treat-

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